QUARTERLY SUMMARY

OF THE

IMPROVEMENTS AND DISCOVERIES

IN THE

MEDICAL SCIENCES.

ANATOMY AND PHYSIOLOGY.

1. *Glycogenesis.*—The late Nos. of the *Revue Scientifique* contain a *résumé* of a very interesting course of lectures "On the Phenomena of Life common to Animals and Plants," delivered by M. Claude Bernard at the Muséum d'Histoire Naturelle de Paris. Notwithstanding their somewhat general title, these lectures are almost entirely devoted to the subject of Glycogenesis, the mystery of which has been so greatly elucidated by M. Bernard himself. The first lectures were occupied in describing the various forms of sugar, the tests indicating the presence of glycose, and the mode in which the quantity of that substance present in any fluid may be estimated. He himself always employs Barreswil and Fehling's fluids; but observes that the aldehydes, uric acid, leucin, hypoxanthin, mucus, cellulose, tannin, chloroform, and chloral, all act in reducing copper in the presence of strong alkalies like glycose, and consequently their absence must be ascertained before any conclusions can be drawn in regard to the amount of glycose in any fluid. He draws with a master hand an outline of the successive steps by which our present knowledge has been attained: how the sugar shown to exist in the blood was originally believed to be entirely derived from without; how by feeding a dog for weeks exclusively on lean meat it was concluded that it must be found within the economy; how by comparative analyses of portal and hepatic venous blood the liver was shown to play an important part in the process; and how by the demonstration of sugar in water transmitted through the liver after the vessels had been thoroughly cleared of blood that organ was proved to possess, not a mere converting power on some saccharine compound contained in the blood, but the capability of producing an amyloid substance, which, under the influence of some ferment—such as that produced by the pancreas—is susceptible of conversion into glycose, and is thus fitted for the nutrition of the body. Further research showed, as all the world now knows, that this substance was insoluble, and M. Claude Bernard applied the name of "glycogen" to it. In his eleventh lecture he criticises Dr. Pavy's views, and maintains, in opposition to that experimenter, that the formation of *sugar* is not a post-mortem change, but a function of the liver, the sugar during life being instantaneously carried off by the blood, though accumulating in the organ after death. The ready passage of the saccharine substance into the blood is, he points out, materially facilitated by the peculiar relations of the hepatic veins to the hepatic cells, and by the action of the muscular coats of the walls of those veins. The nerves of the liver come from three sources: the sympathetic, the pneumogastric, and the phrenic; the branches of the latter supplying the muscular coats of the veins. And M. Bernard tells how he was led, from the analogy of salivation being

induced by pricking the root of the fifth, to try the effects of puncture of the fourth, ventricle, though it was by a mere accident that he discovered its action, the first animal experimented on being rendered highly diabetic, though no effects were produced in the following six or seven. The increased production of sugar in this case M. Bernard attributes partly to an increase in the activity of the circulation, and partly to the direct action of the sympathetic system on the hepatic tissue.

As regards embryonic life, glycogen appears at a very early period in the embryo and its membranes: sometimes, as in the Rodents, existing between the maternal and fœtal portions of the membrane; sometimes, as in the Ruminants, being found on the internal surface of the amniotic membrane. Towards the close of intra-uterine life it diminishes in the membrane and accumulates in the fœtus. In the bird's egg sugar exists in notable quantity, and is contained in the white: if fecundation do not occur, it rapidly disappears; but if impregnation is effected, the vitellus quickly becomes charged with glycogen—the several tissues, with the exception of the muscles, becoming charged with it towards the close of incubation.

Amongst the invertebrata glycogen is widely distributed; and M. Bernard shows the fact, interesting to gourmands, that oysters, crabs, lobsters, and fish, when in prime condition for eating, contain abundance of glycogen; whilst, when out of condition, as when moulting (in the case of crabs), or when allowed slowly to die by asphyxia, the glycogen is entirely used up.

In giving his final conclusions, M. Bernard states that he has been led to regard glycose ($C_{12}H_{12}O_{12}$) as the pivot on which the whole subject of glycogeny turns. It is, he says, both the primitive substance and the final substance in a long series of ascending and descending changes, and it can undergo various progressive or retrogressive modifications. Neither starch nor cane-sugar is of the least value; but the glycose formed in the economy, if not required, can be stored up in the form of glycogen, which can again, when the wants of the system demand it, undergo ready conversion into glycose. The precise mode in which this last is applied in the process of nutrition is still a matter that requires investigation.

The whole subject of glycogenesis is a striking example of what may be done by patient "questioning of nature;" and there can be little doubt that subsequent researches conducted in the same spirit as those undertaken by this distinguished physiologist will hereafter furnish us with complete information of the part played by every kind of aliment, of the modifications each undergoes in the process of assimilation, the mode in which it is applied in the processes of nutrition, and, finally, the retrogressive changes it undergoes before being discharged from the body as effete and exhausted material.—*Lancet*, Nov. 23, 1872.

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2. *Cutaneous Absorption.*—In the *Moniteur Scientifique* for September, M. PAPILLON gives a sketch of what has recently been done on this subject, from which we take the following summary. It has long been well known that liquid substances and essences are readily absorbed by the skin. The question as regards solids is more difficult, and has given rise to much discussion.

M. Roussin, of Val-de-Grâce, maintained some years ago that alkaline iodides could be absorbed by the skin if incorporated with fatty matters. From baths containing these salts he found no absorption, but if the skin was rubbed with a pomatum containing them, iodine was afterwards found in the urine. A dry shirt, which had previously been dipped in a solution of iodide of potassium, occasioned absorption in the wearer; but M. Roussin explained this by saying that a pomatum of iodide was really formed with the fatty matters of the skin.

M. Rabuteau vigorously refuted these conclusions. He pointed out that in both cases, of the iodised pomatum and of the shirt, iodine was set at liberty. The salt was decomposed by ozone and by the acids of the perspiration, and iodine was absorbed in the state of vapour. The proof that fatty matters had no part in the phenomenon was, that, if the pomatum was prepared with bromides, which are less easily decomposed than iodides, there was no absorption,